APPENDICITIS

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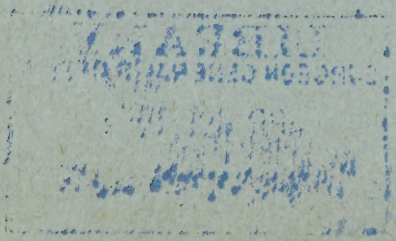
REPRINTED FROM
THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION
JULY 22, 1899.

CHICAGO
AMERICAN MEDICAL ASSOCIATION PRESS
1899



APPENDICITIS.*

AS A CAUSE OF INFLAMMATORY DISEASE OF THE RIGHT OVARY AND TUBE.

BY A. J. OCHSNER, M.D.

During the past five years surgeons have frequently observed the fact that appendicitis may occur in patients suffering from an inflammatory condition of the ovaries and tubes. In reviewing the appendicitis literature, I found a number of articles treating directly of this feature, while it is referred to occasionally in articles discussing the etiology and diagnosis of salpingitis.

Most of these observers speak of the difficulty encountered in making a differential diagnosis. George R. Fowler[1] points out the fact that the proximity of the appendix to the adnexæ may confuse both objective and subjective symptoms, making differential diagnosis especially difficult.

Sonnenburg[2] points out the frequency with which the two conditions are confounded, as well as the fact that they may occur together, but does not place appendicitis in a casual relation to inflammation of the adnexæ with sufficient emphasis. Dr. Krueger[14], Sonnenburg's assistant, describes twenty-one cases in which his chief found the appendix and the ovary and tube simultaneously involved, giving an abundance of valuable experience especially in the direction of diagnosis. Deaver[3] says that if the appendix is very long and overhangs the brim of the pelvis, it may lead to disease of the pelvic contents. He cites a case in which "the right ovary was the seat of an abscess which had evidently been infected by the perforated appendix[15]." Delagénière[4] considers

*Presented to the Section on Surgery and Anatomy, at the Fiftieth Annual Meeting of the American Medical Association, held at Columbus, Ohio, June 6-9, 1899.

the disease of the appendix secondary to the inflammation of the uterine appendages, in case they occur in the same patient. M. Borchardt[5] shows that there is a relation between the two conditions. C. Bernardbeig[6] reports an interesting case in which an appendicitis due to a foreign body in the organ coexisted with double salpingitis. Charles Polle[7] has written fully on this condition. H. Barnsby[8] shows that appendicitis may be caused by inflammation of the adnexæ. J. M. Brooks[9] as early as 1895, in the discussion of a paper by Robert Morris, stated that he had found both conditions in the same patient. A year ago an interesting paper by T. J. Rhoads[10] brought out the same fact. Richelot[11] reports six cases in which the differential diagnosis was impossible. Dr. Coe of New York[12] states that appendicitis occurs as a complication of disease of the adnexæ, and that the latter condition is sometimes secondary to the former. Howard Crutcher[16] points out the likelihood that the appendix has much to do with inflammation of the adnexæ. Lennander[18] says that whenever appendicitis results in peritonitis in the iliac fossa and in the pelvis, it is plain that disease of the adnexæ may result. Vautrin[17] points out the similarity between appendicitis and pyosalpinx and their intercurrent effect, but does not state clearly the effect of one upon the other.

It is impossible to review everything that has been written upon the subject of appendicitis, because the past few years have averaged over three hundred articles each upon this subject, but, so far as my investigation of the literature has extended, no author seems to lay sufficient stress upon this source of inflammation of the right ovary and tube.

A number of years ago, during an abdominal section which I performed for the removal of an inflamed ovary, my attention was drawn to the fact that inflammatory disease, especially of the right ovary and tube, is caused by affection originating in an appendicitis, and as my experience has increased, I have become more and more convinced of the fact that this condition occurs very frequently, and it is the object of this paper to point out

this fact and its importance, and to substantiate these ideas by a number of histories.

At first it seemed difficult to explain how the right ovary and tube could become implicated except in case of perforation or gangrene of the appendix, or the formation of an appendiceal abscess but since the description of the appendicula-ovarian ligament by Clado it can readily be understood how an affection can progress from the appendix to the right ovary, because the lymphatic and vascular supply of the two organs is in a measure common. Nothing can be more simple than the infection of the right Fallopian tube in case of the formation of an appendiceal abscess, because the fimbriated extremity is most perfectly constructed for this end. There are other facts which indicate that inflammation of the right ovary and tube is frequently due to appendicitis.

Ribbert[13] in examining the appendix in 400 cases, found fecal concretions in 38, and they were found as often in women as in men, which would indicate that appendicitis is as common in one sex as in the other, notwithstanding the fact that operators in general seem to agree that it is much more frequent in men. This, as well as my own observations, has convinced me that the difference is due to the fact that in women the right ovary and tube is so frequently infected secondarily that these cases are supposed to suffer from the latter condition alone, and that in the treatment of these cases the real cause of the inflammation is entirely overlooked.

It is a generally recognized fact that at least 15 per cent. of all cases of appendicitis occur in children under 15 years of age, and that in these the number of girls equals the number of boys. This is also confirmed by my observations. Later in life, if there is a recurrence it is at once diagnosed in the male as an appendicitis, while in the female a certain number of those cases are diagnosed as ovaritis or salpingitis.

In many of these patients in whom there is but a catarrhal appendicitis, possibly complicated with the presence in the appendix of a fecal concretion, the patient is not disturbed except during the period of menstrua-

tion, when the temporary congestion is sufficient to increase the irritation in the appendix, as well as in the Fallopian tube, giving rise to a pain of greater or less severity, which is usually looked upon as dysmenorrhea due to the presence of salpingitis.

A number of my patients showed this symptom when the operation demonstrated the presence of catarrhal appendicitis, with or without a foreign body in the lumen of the appendix, or there were severe adhesions showing that at some previous time a portion of the appendix had become gangrenous, or there was partial or complete obliteration of the lumen of the appendix—appendicitis obliterans of Senn. Whenever the pain in dysmenorrhea is entirely or mostly on the right side, especially if it is quite high, it is well to suspect the presence of an appendicitis in connection with the disturbance of the ovary and tube.

In giving the histories of my cases, I will give the one which drew my attention to this fact in full, and then all the cases which I treated the past year—1898—consecutively, and in abstracts only, as a review of all my cases of this class would make the paper unnecessarily long and correspondingly uninteresting.

Case 1.—Miss Lillie H., aged 19 years, the daughter of healthy parents, had enjoyed good health until four years previous to the operation, when she was attacked with a very sudden, severe pain in the right hypochondriac region, accompanied with nausea and vomiting. At first a diagnosis of intestinal obstruction was made, but later this was changed to circumscribed perityphlitic peritonitis.

The treatment consisted of hot fomentations and hypodermic injections of morphia. She was confined to her bed for three weeks. During the next year she had a similar attack which was now supposed to be due to inflammation of the ovary and tube. Later in the same year she had another attack, and was treated by means of tonics, rest in bed and electricity. One year previous to the operation she had another attack, which again yielded to treatment by means of sedatives and hot fomentations. At this time the attending physician, a

man of excellent ability, found a prolapsed uterus, an anteflexed cervix, and an extremely tender prolapsed right ovary. She was now treated with counterirritation over the abdomen, local treatment of the cervix and the vaginal vault with tincture of iodin and warm douches. Cotton tampons were tried, but the right ovary was so tender that the patient could not endure the pain.

Her menstruation had always been painful and scanty. She had constantly suffered from constipation. Her appetite had been insufficient, and she had not slept well. During all this time the hygienic surroundings of the patient were excellent. Still she had constantly lost in strength. For several months she had been a confirmed neurasthenic, confined to her bed the greater part of the time.

Physical examination revealed a fairly well nourished girl of medium size, with masculine features, dark hair and eyes, skin rough, upper lip and chin covered with hair, and facial expression indicative of severe suffering. Lungs, kidneys and heart were normal; there was a slight anemic murmur. The uterus was prolapsed, the right ovary prolapsed and so extremely tender that it was impossible to determine the extent of adhesions. A diagnosis of chronic ovaritis was made, and an abdominal section recommended.

On Oct. 18, 1888, a median incision was made, extending from the symphisis pubis to within an inch of the umbilicus. This disclosed the following condition: The omentum was adherent about the cecum, the lower end of the ilium and the appendix and also to the parietal peritoneum, indicating that what I supposed to be a perityphlitic abscess had existed during the first attack mentioned in the history, and that the other conditions were secondary. The right ovary and tube were adherent to the uterus and to a mass consisting of the cecum, appendix and omentum, being held by strong cicatricial adhesions, which accounted for the extreme tenderness of the right ovary. I removed the right ovary and tube, loosened the adhesions which bound down the uterus, but did not dare to disturb the adhesions about the cecum. The wound was closed without drainage.

The patient made a normal recovery. Her neurotic condition vanished, her skin became clear, and she developed into a very beautiful young woman. For two years she had not been able to attend school at all, and for the two years previously only a small portion of the time. Two months after the operation she entered school again and attended regularly for the remainder of this and the next year, when she married. She has since borne five healthy children, and has constantly been in excellent health.

I saw her again in September, 1898, ten years after her operation, and fourteen years after her original attack of appendicitis, and found her in a most excellent condition.

In this case it is plain that an abscess had formed about the appendix, making the latter organ harmless, but that a portion of the infectious material had been carried down to the right ovary and tube, causing an infection of these organs, which caused the severe suffering. Being a virgin, the infection must have come from the appendix.

ABSTRACTS OF HISTORIES OF SIMILAR CASES OPERATED AT AUGUSTANA HOSPITAL DURING 1898.

CASE 1.—No. 4677, Miss E. H., aged 16 years, entered the hospital March 1, 1898. The patient has always enjoyed good health, having grown up in the country. She menstruated at 13 years of age, without pain until one year ago, when she suffered from a typical attack of appendicitis. Since then she has suffered severely during each menstrual period. She has had four typical attacks of appendicitis during the past year; the last one began one month ago, and she is just now recovering. Her present condition is that of a very well nourished girl, evidently unusually strong and vigorous when in good health; she is somewhat anemic, tongue clear, appetite good previous to recent attack, now absent; heart, lungs and kidneys normal. A slight swelling is perceptible over the region of the appendix, also slight dulness on percussion, vaginal examination cannot be made, as patient is a virgin. She has been nauseated, but has abstained from food almost completely during attack.

Diagnosis.—Acute appendicitis; fourth attack.

Laparotomy showed the appendix perforated, imbedded in the midst of adhesions, being surrounded with about half an ounce of pus containing a fecal concretion. The right ovary and fimbriated extremity of the tube were strongly adherent

to the surrounding tissues, and helped to form the abscess wall.

CASE 2.—No. 4679, Miss H. M. B., aged 20 years, was admitted March 1, 1898. Aside from the ordinary children's diseases patient has had no severe sickness. Menstruation began at 15 years of age, being regular and only very slightly uncomfortable, and not painful until two years ago, when she began to feel a sharp pain in the right inguinal region during the greater portion of the period. She was able to control this by taking acetanilid, viburnum and whisky. During the last three periods the pain has been excruciating, necessitating the use of morphia hypodermically. The pain is always located precisely in the region of McBurney's point. During the interval this portion of the abdomen is somewhat tender under pressure. The patient has lost several pounds in weight during the past year.

Her present condition is that of a slightly built girl; her facial expression indicates that she has suffered severely of late; tongue coated; appetite bad; bowels regular; heart, lungs and kidneys normal; tenderness over region of appendix.

Diagnosis.—Acute catarrhal appendicitis.

Laparotomy showed the appendix to be severely congested, club-shaped and containing fecal concretion five-eighths of an inch in length and a quarter of an inch in diameter—too large to escape into the cecum on account of the constricted condition of the proximal end of the lumen. The right ovary is also severely congested and more than twice the size of the left one.

CASE 3.—No. 4716. This patient, a married woman 20 years of age, came under my care March 14, 1898, giving the following history:

She was always healthy until two years ago, when she experienced a very severe instrumental labor, lasting sixty hours, during which she suffered a severe laceration of the cervix and perineum. She has not been well since; her menstruation has been irregular, the discharge being profuse and somewhat prolonged. During the past year she has had several attacks of severe pain in the right inguinal region, usually lasting from four to five days, and recurring every four to ten weeks. Two weeks ago her present attack commenced with severe pain in the region of the appendix. She has suffered from nausea but has not vomited. The lower part of the abdomen has been exquisitely tender. She has had no chills. The temperature has not been observed.

Her present condition is that of a fairly well nourished woman, tongue coated, appetite poor, constipated; heart, lungs and kidneys normal. There is considerable yellowish vaginal discharge; the lower portion of the abdomen is tender and tense; perineum and cervix are lacerated; there is a fluctuating very tender mass to right of uterus.

Diagnosis.—Right-sided pyosalpinx, involving vermiform appendix.

A laparotomy demonstrated the presence of an abscess involving the right ovary, tube and appendix, probably, though not positively, of tubal origin.

CASE 4.—No. 4766, Mrs. E. H., 26 years of age, married about two years, was admitted March 25, 1898. She gave the following history:

She had scarlet fever, diphtheria, pleurisy and typhoid fever as a child. Menstruation began at 18; always regular and painless until three years ago. She has one living child, 5 months old; had rather hard instrumental labor; and has suffered considerable pain in lower portion of abdomen ever since. She has had a few chills, some rise of temperature, and had a fetid vaginal discharge for several weeks after child was born. She was compelled to cease nursing the child when it was two months old, on account of weakness; has menstruated normally twice since, six and two weeks ago. Three months ago, while sitting perfectly still, she had a severe sudden pain in the region of the appendix, lasting two hours, then pain became more profuse and lasted for two days. She had a chill, followed by a fever; vomited once; was constipated. Six weeks and two weeks ago she had slight but similar attacks. One week ago she had a very severe attack; vomited several times; had chills, fever, headache; pain extended in the direction of the umbilicus.

Her present condition is that of a fairly well nourished woman; tongue coated; soft and flabby; appetite fair; bowels constipated; pulse 110; strong, compressible; heart, lungs and kidneys normal; tenderness over region of appendix and right ovary.

Diagnosis.—Acute attack of recurrent catarrhal appendicitis, implicating right ovary and tube.

This was confirmed by the laparotomy, the primary trouble being in the appendix.

CASE 5.—No. 4794, Mrs. J. B. H., aged 26 years, married one year, was admitted April 5, 1898. As a child she was well. She began menstruation at 14 years of age; was never regular, and usually painful; the period varying from four weeks to three months. She has had two typical attacks of appendicitis; one four months ago, lasting two weeks, the other six weeks ago, lasting three weeks, and has been out of bed a little over a week since the last attack.

Her present condition is that of a well nourished but slightly anemic woman, showing the effects of her recent illness. There is considerable tenderness in the region of the appendix. Both ovaries are tender upon vaginal examination.

Diagnosis.—Recurrent appendicitis complicated with ovaritis.

A laparotomy demonstrated a universally adherent appendix, the distal three-quarters of an inch being almost completely destroyed, probably by an attack not recorded in the

history, as the patient's parent could not be consulted, and she was unable to give a history of her childhood, although she thought that her health had been generally good. The lumen of the appendix was almost completely obliterated near its attachment to the cecum, preventing the escape of a quantity of pus and mucus and fecal concretions in its lumen. Both ovaries showed old adhesions, probably resulting from infection at time of destruction of the distal end of the appendix. Both ovaries, but especially the right one, and the right tube were acutely congested.

CASE 6.—No. 4823, Mrs. M. D., aged 38 years, married seventeen years, the mother of five children, was admitted April 8, 1898. She does not remember her childhood's diseases. She began to menstruate at 15; had an attack similar to the present one at the age of 26; a second one at 35, and several slighter attacks which she cannot locate accurately as to time. Two weeks ago she suddenly felt a severe pain in the right inguinal region, which was especially severe upon trying to extend the thigh. She has felt slightly chilly several times, but has had no real chill, and has been nauseated but has not vomited. Her complexion is slightly yellowish, but no distinct icterus.

Her present condition is that of a fairly nourished woman, with heart, lungs and kidneys normal. She has pain and tenderness in the region of the appendix, and the right ovary is tender.

Diagnosis.—Recurrent appendicitis, implicating right ovary and tube.

The laparotomy demonstrated an appendix bent upon itself at an acute angle about its middle on account of strong adhesions, due to an inflammation long past. The enlarged distal end contained a quantity of septic material. A marked congestion and recent adhesions demonstrated the presence of a recent inflammation. The right ovary contained a cyst as large as a hen's egg. The right tube was severely congested, showing a recent irritation; it was very tortuous and the fimbriated extremities were agglutinated to a considerable extent. The gall-bladder contained two very sharp gall-stones, as large as a bean.

CASE 7.—No. 4950, Miss E. B., entered hospital May 16, 1898.

She as very healthy until about one year ago when she acquired a right femoral hernia, which was relieved by an operation seven months ago. This, however, had no effect upon the pain in the right inguinal region, from which she still suffers. The patient is a virgin and consequently the examination is made entirely by external manipulation. There is severe tenderness upon pressure in the region of the appendix and the right ovary; other organs are normal. Menstruation is painful.

Diagnosis.—Chronic appendicitis.

Laparotomy shows appendix 10 inches in length containing a number of fecal concretions, the largest one the size of a pea; proximal end constricted but not obliterated. The distal end of the appendix was strongly adherent to the ovary and tube, the fimbriated extremity of the latter being also obliterated.

Case 8.—No. 4989, Miss J. F., a saleslady, aged 33 years, was admitted to hospital May 28, 1898.

She has always been well until two months ago; began to menstruate at 17 years of age, suffering very slight pain at times. Eight weeks ago she began to suffer from severe pain distributed over the entire abdomen; this became more and more circumscribed during the first three weeks, when it became permanently located in the right inguinal region. She suffered from nausea and vomiting, but had no chills. During the first week the pain was severe; during the second week the patient was up a little; during the third week she menstruated and immediately after had a relapse. From this time on she had chills repeatedly. A week ago she menstruated and suffered more pain than usually. The pain and tenderness in the right inguinal region have persisted. Her present condition is that of a slightly emaciated woman; complexion not clear; tongue coated, appetite fair, bowels regular, pulse 100, fairly strong, has temperature of 100 in the afternoon. Lungs and kidneys are normal; first sound over mitral valve is not perfectly clear, otherwise heart is normal. A large, rather firm, mass is found in the lower portion of the abdomen, on the right side, extending to the median line and nearly up to the umbilicus. The mass can be felt through the vagina.

Diagnosis.—Pelvic abscess probably of tubal origin.

The laparotomy demonstrated the presence of a universally adherent ovarian cyst, to the upper portion of which was attached a long inflamed perforated appendix. The cyst had evidently caused neither pain nor inconvenience until it became infected from the appendix.

Case 9.—No. 5137, Mrs. Wm. D., 32 years of age, married at the age of 29, was admitted July 9, 1898.

As a child she was delicate. She had pneumonia several times; menstruated at 11; suffered from an attack of peritonitis as a child. From 23 to 28 years she suffered from dyspepsia, since then from constipation. At the ages of 24 and 25 she suffered from cholera morbus during the summer for a week at a time, and about three years ago from intestinal obstruction. She was confined to bed for two months, then she slowly improved, until one year ago, when she seemed quite well. Shortly after this she suffered from pain in the region of the appendix and from nausea and vomiting. Nine months ago she had a similar attack, confining her to bed for six weeks. Since then she has improved slowly, having several slight attacks of a similar character but less severe, and lasting only a few days at a time.

Her present condition shows her to be about twenty pounds below average weight; her tongue is coated; her appetite fair; starches and carbohydrates cause eructations. She suffers from nausea occasionally; is constipated; lungs, heart and kidneys are normal. There is tenderness over the appendix and right ovary, and a swelling the size of a small hen's egg is perceptible upon digital examination, in region of right ovary and tube.

Diagnosis.—Recurrent appendicitis with secondary infection of right ovary and tube.

Laparotomy showed the proximal end of the appendix obliterated, the latter being the size of a thumb, thoroughly distended with mucus. The Fallopian tube was in precisely the same condition, being about twice the size of the appendix, perfectly closed at both ends and filled with the same material. The appendix, ovary and tube were surrounded by a mass of adhesions.

Case 10.—No. 5145, Mrs. F. P., 25 years of age, was admitted to hospital July 11, 1898.

The patient enjoyed good health until shortly after her marriage, three years ago, when she began to suffer from severe pain in the region of both ovaries and tubes. Two and a half years ago she had a severe attack of peritonitis, resulting in a large pelvic abscess, from which over a quart of extremely fetid pus was evacuated by a vaginal incision. Drainage was established, and the patient became apparently well until ten months ago, when the abscess refilled and was again evacuated in the same manner, again apparently resulting in recovery.

Her present condition shows her to be badly nourished; tongue thickly coated; appetite poor; constipated; pulse normal; menstruation regular but painful and too profuse; heart and lungs normal; urine contains blood, pus and albumin, is strongly acid, is loaded with urates, and has a specific gravity of 1030. Pain and tenderness exist in the right inguinal region. Bimanual examination shows presence of an inflammatory mass in the right inguinal region.

Diagnosis.—Pyosalpinx probably implicating appendix.

A laparotomy demonstrated the right tube to be distended to the size of three fingers and closed at both ends; the appendix is constricted but not completely obstructed at proximal end, and contains large fecal stone also mucus and detritus. The appendix, ovary and tube are adherent to each other as well as to omentum and cecum.

Case 11.—No. 5235, Mrs. M. L., aged 31 years, entered the hospital August 8, 1898.

The patient had the usual children's diseases, but does not remember having been severely ill. She had suffered from indigestion and constipation for a long time—cannot tell how long. For several years she has had a heavy feeling in the region of the appendix, which became quite painful at times. Six

months ago, immediately after her confinement, she suffered from acute pain in the right inguinal region. At this time she had a slight chill followed by a little fever. This became more diffuse, but later again circumscribed. There is now a constant dragging pain in the right inguinal region. The right thigh cannot be fully extended without pain. This condition has not changed during the past month.

Her present condition is that of a poorly nourished woman, anemic, with tongue coated, appetite insufficient, bowels constipated, pulse weak. There is tenderness upon pressure in the right inguinal region. Bimanual examination determines a small mass in the region of the right Fallopian tube, but extending up too high to be confined to that organ.

Diagnosis.—Doubtful, probably recurrent catarrhal appendicitis with secondary infection of tube and ovary.

Laparotomy disclosed a small mass in the right inguinal region bound together by strong adhesions, containing a club-shaped appendix which had at one time been perforated, an ovary covered with connective tissue and containing several small cysts, the largest the size of a hen's egg, and the right tube ¾ of an inch in diameter closed at both ends and containing a clear fluid.

Case 12.—No. 5453, Miss E. W., 21 years of age, was admitted October 4, 1898.

She had the usual diseases of childhood, but has otherwise been well. Menstruation began at 16, being regular but very painful, especially on the right side. About a year ago patient experienced pain and tenderness in the right inguinal region, which has persisted ever since. Four months ago a sudden exacerbation compelled her to remain in bed for three weeks. At this time she suffered from severe pain, chills and fever. Nine weeks ago she suddenly experienced the same symptoms, together with vomiting. For three weeks she has been better.

Her present condition shows her to be well nourished; tongue clean; appetite good; bowels regular; heart, lungs and kidneys normal; moderate bilateral enlargement of thyroid gland; abdominal walls thick; pain and tenderness over McBurney's point; no abnormal dulness. Vaginal examination is negative except for tenderness in region of right ovary and tube; no accumulation; no perceptible enlargement.

Diagnosis.—Recurrent appendicitis, possibly involving right ovary and tube.

Laparotomy demonstrated the following conditions: The distal half of the appendix was completely destroyed by an inflammation, evidently many years past, and not determined in the history; the proximal half the size of a thumb, in an inflamed condition, the walls being greatly thickened. An adhesion extended from the end of the obliterated appendix in the direction of the right ovary, which was covered with cica-

tricial tissue. The right Fallopian tube was very tortuous and severely congested, both ovary and tube having evidently suffered as a result of secondary infection from the inflamed appendix.

Case 13.—No. 5458, Miss D. F., aged 28 years, entered the hospital October 5, 1898.

The patient was healthy until 13 years of age, when she suffered from what was supposed to be typhoid fever. She is said to have had a very sudden attack of the fever, with severe pain over the entire abdomen, later confined to the right inguinal region. She vomited, had intestinal obstruction and in fact all the symptoms of a gangrenous appendicitis wrongly diagnosed as typhoid fever. Since this time the patient has never been well, has constantly suffered from indigestion, constipation, severe dysmenorrhea and general abdominal pains. She is now a confirmed invalid.

Her present condition shows her to be badly nourished; her facial expression is that of a patient who has suffered severely for years; her heart is normal but rather weak, respiration is shallow, kidneys normal; pain and tenderness over entire abdomen but especially over appendix and right ovary.

Diagnosis.—Adhesions following extensive peritonitis due to appendicitis.

Laparotomy demonstrated only the proximal portion of the appendix as present, held down by strong, old adhesions, the distal portion being recognizable as a band of connective tissue. The right tube is club-shaped and adherent to the ovary and remnant of the appendix by means of strong, old adhesions.

Case 14.—No. 5534, Miss R. P., aged 24 years, was admitted Oct. 30, 1898.

She was always unusually vigorous and well, and able to work until six months ago, when she suddenly experienced an excruciating pain in the region of the appendix, followed by severe tenderness in the entire abdomen, which later became confined to the right inguinal region. She was nauseated, and the pain was so severe that morphin had to be used hypodermically to secure relief. Since this time each menstrual period has been very painful, and she has suffered from two acute attacks since the first one. The last attack, which occurred a week ago, was especially severe.

Her present condition is that of a fairly nourished young woman, normal in every resepect except that she suffers from pain in the right inguinal region, which is increased upon pressure. The abdominal walls are tense, and the right hip cannot be fully extended without giving rise to pain.

Diagnosis.—Recurrent appendicitis, probably involving the right ovary and tube, on account of the increased pain present during menstruation.

Laparotomy demonstrated the appendix to be constricted near its middle and bound down at this point by a strong ad-

hesion, which evidently existed for a considerable time. The distal end contained mucus and detritus and was considerably distended. The right ovary and tube were severely congested, and the right tube quite tortuous.

Case 15.—No. 5535, Miss J. A., 24 years of age, was admitted to the hospital Oct. 30, 1898.

She had children's diseases, but was otherwise strong and healthy, having spent her youth on a farm. Menstruation began at 15, being regular and normal. Three years ago she first experienced dull pain in the right inguinal region; about the same time she began to suffer frequently from nausea. From this time on she has felt some pain in this region during each menstrual period. This has increased very greatly during the past year, so that she scarcely recovers now from the effects of one period before the next one begins. Her former vigorous appearance has disappeared, and she has now the look of an invalid.

Her present condition is that of a fairly well nourished, strongly built young woman; tongue coated; appetite not satisfactory; bowels constipated, heart, lungs and kidneys normal; complains of pain in right inguinal region, which is considerably increased upon pressure. She has received local treatment of uterus. The right ovary is tender, but not perceptibly enlarged.

Diagnosis.—Chronic catarrhal appendicitis.

Laparotomy disclosed that the appendix contained several concretions, varying in size from a grape seed to an orange seed. The mucous membrane showed a catarrhal inflammation. The right ovary was found in a condition indicating chronic inflammation.

A review of the histories from which I have constructed the accompanying table which represents 103 cases at the Augustana Hospital, in which I removed the appendix, for inflammatory disease, during the year 1898, will demonstrate the following significant facts: There were 90 patients suffering primarily from appendicitis and 13 in which the primary disease was either in the adnexæ, or both appendix and tubes were so extensively implicated that it was impossible to determine the primary seat of the inflammation. Of the patients suffering primarily from appendicitis, 39 were male and 51 female. Of the latter 36 suffered from appendicitis alone, and 15 suffered from appendicitis with a secondary involvement of the right ovary and tube. Eleven patients were under 15 years of age, and of these 5 were boys and 6 were girls. All the

TABLE OF APPENDICITIS CASES OPERATED AT AUGUSTANA HOSPITAL DURING THE YEAR 1898.

I. Children 15 years of age and younger; five boys, six girls.

No.	Record No.	Date of Admission.	Age.	Diagnosis.	Condition found during operation.
1	4612	Feb. 8.. .	14	External fistula, appendiceal abscess	Perforated appendix communicating with fistula.
2	4896	Apr. 28. . .	15	Recurrent appendicitis, four attacks	Greatly thickened suppurating appendix, old adhesions.
3	4912	May 4.. . .	15	Recurrent appendicitis, acute attack..	Strongly adherent appendix, abscess at extremity.
4	5374	Sept. 13.. .	8	Recurrent appendicitis, second attack	Perforated appendix containing concretions, abscess.
5	5555	Nov. 6. . .	4	Acute perforative appendicitis.	Gangrenous appendix about to perforate.
1	4825	April 8. . .	12	Recurrent perforative appendicitis	Gangrenous perforated appendix.
2	5234	Aug. 7.. . .	11	Perforative appendicitis, diffuse peritonitis..	Gangrenous perforated appendix, general peritonitis.
3	5305	Aug. 29 . .	8	Perforative appendicitis, large abscess.	Gangrenous perforated appendix, large circumscribed abscess.
4	5392	Sept. 18.. .	11	Perforative appendicitis.	Gangrenous perforated appendix containing many concretions.
5	5489	Oct. 16. . .	13	Recurrent appendicitis, mild attack	Adherent club shaped appendix, constrictions, abscess in end.
6	5523	Oct. 26. . .	10	Perforative appendicitis, abscess	Perforated gangrenous appendix, circumscribed abscess.
				II. Adults suffering from appendicitis uncomplicated; thirty-four males, thirty females.	
1	4495	Jan. 4. . .	28	Recurrent appendicitis, five years	Strong adhesions to omentum and cecnm partly obliterated.
2	4535	Jan. 16 . .	31	Recurrent appendicitis, acute attack.	Catarrhal appendix, adhesions, appendix contains concretions.
3	4658	Feb. 22 . .	44	Recurrent appendicitis, in interval	Appendicitis obliterans, adhesions.
4	4684	March 3. .	35	Recurrent appendicitis, violent acute attack.	Gangrenous perforated appendix, diffuse peritonitis.
5	4724	March 14 .	35	Chronic appendicitis..	Tubercular appendicitis.
6	4845	Apr. 14. . .	36	Recurrent appendicitis, acute attack.	Appendicitis obliterans, abscess in end.
7	4895	Apr. 28. . .	18	Acute perforative appendicitis.	Perforated gangrenous appendicitis, abscess in pelvis.
8	4902	May 1.. . .	29	Acute perforative appendicitis	Perforated gangrenous appendix, abscess retrocecal.
9	4932	May 10. . .	35	Acute recurrent appendicitis.	Catarrhal appendicitis, fecal concretions.
10	4952	May 15. . .	30	Acute perforative appendicitis	Gangrenous perforated appendix, general peritonitis.
11	4991	May 29. . .	24	Recurrent appendicitis, in interval	Adherent club-shaped appendix, had been perforated.
12	5062	June 20 . .	28	Recurrent appendicitis	Adherent appendix, obliterates lumen proximal end.
13	5071	June 22 . .	17	Recurrent appendicitis	Appendix curled up snail-shaped, strongly adherent.
14	5083	June 26 . .	28	Hernia following incision for appendicitis operation	Adherent appendix, scar in place of gangrenous portion.
15	5112	July 3.. . .	20	Recurrent appendicitis, gangrenous appendix	Gangrenous appendix, about to perforate.
16	5141	July 10 . .	28	Chronic appendicitis, ten weeks.	Gangrenous appendix, leaving scar tissue and abscess.
17	5143	July 10 . .	28	Recurrent appendicitis.	Partly obstructed appendix with large stone.
18	5179	July 19 . .	27	Acute appendicitis, fulminating.	Acute suppurative appendix, not circumscribed.
19	5182	July 21 . .	23	Recurrent appendicitis, in interval..	Partly obliterated, club-shaped appendix, enteroliths.
20	5192	July 26 . .	24	Recurrent appendicitis, in interval..	Partly obliterated, club-shaped appendix. enteroliths.
21	5198	July 25 . .	22	Acute suppurative appendicitis	Severely congested adherent appendix, quantity free fluid in abdomen.
22	5201	July 27 . .	27	Acute perforative appendicitis, intest. and obstruct.	Perforated gangrenous appendix. general peritonitis.
23	5227	Aug. 4. . .	33	Acute perforative appendicitis.	Perforated gangrenous appendix, circumscribed abscess.
24	5279	Aug. 21 . .	33	Recurrent appendicitis, acute.	Perforated gangrenous appendix, circumscribed abscess.
25	5413	Sept. 25 . .	18	Recurrent acute attack, catarrhal.	Severely congested appendix distended with mucus.
26	5424	Sept. 27 . .	32	Recurrent appendicitis, third attack in one month.	Cicatricial construction, foreign body,
27	5466	Oct. 6.. . .	47	Recurrent appendicitis, obliterans	Club-shaped appendix totally obstructed, large foreign body.
28	5492	Oct. 17. . .	22	Perforative appendicitis, gangrenous peritonitis.	Extensive adhesions, general peritonitis.
29	5539	Nov. 1.. . .	30	Traumatic chronic appendicitis..	Strongly adherent partly obliterated appendix.
30	5542	Nov. 2. . .	44	Acute peritonits, strangulated hernia	Perforated appendix, cecum and omentum in inguinal hernia.
31	5626	Dec. 1. . .	26	Recurrent appendicitis, acute attack.	Adherent appendix, abscess in distal end.
32	5648	Dec. 11 . .	28	Chronic appendicitis.	Adherent appendix, cicatricial thickening, abscess in end.
33	5687	Dec. 27 . .	21	Recurrent appendicitis, in interval	Adherent club-shaped appendix, had been perforated.
34	4891	Apr. 28 . .	25	Recurrent appendicitis, in interval.	Adherent club-shaped appendix, obliterans, abscess in end.
1	4403	Jan. 4.. . .	56	Recurrent appendicitis, in interval	Adherent club-shaped appendix, fecal concretions.
2	4624	Feb. 13 . .	19	Recurrent appendicitis, acute attack.	Adherent appendix containing abscess and concretions.
3	4645	Feb. 17 . .	28	Recurrent appendicitis, chronic, in interval	Adherent snail shaped appendix, cicatricial constrictions.
4	4678	March 1. .	17	Acute perforative appendicitis	Gangrenous perforated appendix, abscess.
5	4739	March 17 .	24	Recurrent appendicitis, acute attack.	Adhesions causing partial strangulation of appendix.
6	4775	March 25 .	36	Acute appendicitis..	Perforated appendix surrounded with fibrous exudate.
7	4840	Apr. 12 . .	39	Acute appendicitis, perforative	Perforated appendix, abscess containing concretions.
8	4865	Apr. 19 . .	36	Chronic appendicitis, acute exacerbation.	Strongly adherent appendix with acute abscess.
9	4911	May 3.	21	Recurrent appendicitis, convalescent	Adherent appendicitis obliterans.
10	4956	May 18 . .	30	Acute perforative appendicitis	Perforated gangrenous appendix.
11	4966	May 22 . .	40	Chronic appendicitis.	Adherent appendix, mucosa ulcerated and cicatricial.
12	4988	May 28 . .	62	Adhesions following appendicitis.	Strongly adherent, partly obliterated appendix.
13	5037	June 10 . .	23	Recurrent appendicitis, during interval.	Adherent appendix partly obliterated, contains concretions.
14	5068	June 20 . .	20	Recurrent appendicitis, during interval.	Adherent appendix partly obliterated, contains concretions.
15	5070	June 21 . .	58	Perforative appendicitis, acute..	Gangrenous perforated appendix, surrounded with omentum.
16	5099	June 28 . .	41	Chronic appendicitis, interval.	Strongly adherent appendix, had extensive peritonitis.
17	5082	June 26 . .	38	Chronic appendicitis, interval.	Strongly adherent appendix, obliterans abscess in end.
18	5154	July 12 . .	40	Chronic appendicitis, interval.	Strongly adherent appendix, cicatricial contractions.
19	5165	July 14 . .	20	Recurrent appendicitis, interval.	Club-shaped adherent appendix, cicatricial contractions.
20	5169	July 29 . .	18	Acute perforative appendicitis.	Club-shaped adherent appendix with abscess.
21	5176	July 20 . .	49	Adhesions following appendicitis.	Strongly adherent appendix, fixing cecum.
22	5206	July 28 . .	33	Chronic appendicitis, interval.	Adherent appendix, cicatricial constrictions.
23	5212	July 31 . .	34	Chronic appendicitis, recurrent.	Adherent club-shaped appendix, concretions.
24	5248	Aug. 14 . .	55	Tubercular peritonitis..	Tubercular appendix.
25	5258	Aug. 16	20	Recurrent appendicitis, acute attack	Severely congested appendix, containing mucus.
26	5269	Aug. 18 . .	25	Recurrent appendicitis, in interval.	Strongly adherent club-shaped appendix.
27	5299	Aug. 26 . .	17	Intestinal obstruction following app. operation . .	Adhesions causing volvulus of ilium.
28	5411	Sept. 25 . .	39	Chronic recurrent appendicitis, interval	Partly obstructed lumen, large incarcerated enterolith.
29	5619	Nov. 29 . .	24	Acute septic appendicitis	Severely congested acutely inflamed appendix.
30	5663	Dec. 18 . .	21	Recurrent appendicitis, acute perforative	Perforated gangrenous appendix, abscess.
				III. Appendicitis with secondary infection of adnexa; fifteen casses.	
1	4677	March 1. .	16	Recurrent appendicitis, acute attack	Perforated appendix, adherent to right ovary and tube.
2	4679	March 1. .	20	Recurrent catarrhal appendix.	Severely congested right ovary and appendix containing stone.
3	4716	March 12 .	21	Pyosalpinx, recurrent appendicitis	Abscess involving appendix, right ovary and tube.
4	4766	March 24 .	26	Recurrent appendicitis.	Appendix strongly adherent, evidence of perforation, adhesions involving right ovary.
5	4794	Apr. 3.	26	Recurrent appencicitis.	Appendix strongly adherent, club-shaped, distal extremity cicatricial, infected right ovary.
6	4823	Apr. 7. . .	38	Recurrent app., implicating r. ovary and tube.	Constricted distorted appendix, inflamed adherent cystic ovary and tube.
7	4950	May 15 . .	23	Chronic catarrhal appendicitis	Long appendix containing concretions, adherent to ovary and tube.
8	4989	May 29. . .	33	Pelvic abscess, probably tubal.	Acute appendicitis with infected ovarian cyst.
9	5137	July 9.. .	32	Recurrent appendicitis, a secondary pyosalpinx..	Appendicitis obliterans, secondary hydrosalpinx.
10	5145	July 11 . .	25	Pyosalpinx, implicating appendix.	Constricted appendix, containing detritus and secondary pyosalpinx.
11	5235	Aug. 8. . .	31	Chronic catarrhal appendicitis	Appendicitis obliterans, secondary infection of right ovary and tube.
12	5453	Oct. 4.. . .	21	Recurrent appendicitis.	Chronic recurrent appendicitis, secondary ovaritis and salpingitis.
13	5458	Oct. 5.. . .	28	Adhesions following appendicitis..	Chronic recurrent appendicitis, secondary ovaritis and salpingitis.
14	5235	Oct. 20. . .	24	Recurrent appendicitis, secondary ovaritis, salpingitis.	Constricted adherent appendix containing detritis, secondary ovaritis and salpingitis
15	5535	Oct. 30. . .	34	Catarrhal appendicitis.	Catarrhal appendicitis, concretions, chronic ovaritis.
				Patients suffering primarily from inflammation of adnexa and secondarily from appendicitis.	
1	4531	Jan. 12.. .	32	Pyosalpinx..	Hydrosalpinx, cystic ovary, adherent appendix.
2	4762	March 22 .	27	Pyosalpinx..	Suppurating ovarian cyst involving appendix.
3	4811	Apr. 5. . .	45	Chronic appendicitis.	Salpingitis, adhesions of ovary, tube and appendix.
4	4830	Apr. 10. . .	37	Peritoneal adhesions after abortion.	Salpingitis, adhesions of ovary, tube and appendix.
5	4916	May 5.. . .	23	Pyosalpinx..	Pyosalpix with adhesions of appendix.
6	4940	May 12. . .	26	Ovaritis.	Gonorrheal infection both ovaries, tubes and appendix.
7	4943	May 14.	27	Pyosalpinx..	Double pyosalpinx involving appendix.
8	4951	May 15. . .	32	Pyosalpinx..	Suppurating ovarian cyst involving appendix.
9	5067	June 21 . .	34	Pyosalpinx..	Double pyosalpinx involving fecal concretions.
10	5325	Sept. 4. . .	40	Poysalpinx, chronic appendicitis	Double pyosalpinx involving fecal concretions.
11	5423	Sept. 27.. .	26	Salpingitis	Salpingitis right side, catarrhal appendicitis.
12	5454	Oct. 4.. . .	24	Salpingitis	Adherent right ovary, tubes and appendix.
13	5590	Nov. 22 . .	35	Pyosalpinx..	Double pyosalpinx involving appendix.

children suffered from acute attacks, with either gangrenous appendices or perforations.

Judging from this year's experience, as well as from my very much larger former observations, I am certain that the matter of secondary infection, especially of the right ovary and tube, has been very much underestimated. The following conclusions seem to be borne out by this experience:

1. Appendicitis frequently causes inflammatory diseases of the right ovary and tube, and occasionally the left side is also involved.

2. This condition is especially likely to give rise to chronic invalidism, because of the periodic exacerbation resulting from the congestion due to menstruation.

3. In operating for the relief of pyosalpinx, the condition of the appendix should always be determined.

4. In operating for chronic or recurrent appendicitis in patients suffering also from dysmenorrhea, the right ovary and tube should be examined.

5. If the pain is limited to the right side in severe dysmenorrhea, the appendix is frequently primarily involved.

6. In catarrhal appendicitis in which there is a fecal concretion in the appendix, or in appendicitis obliterans, the pain is frequently most severe during menstruation.

7. In patients who have recovered from gangrenous appendicitis there is frequently no further disturbance from the condition of the appendix, except the digestive disturbance due to adhesions, while the secondary disturbance in the ovary and Fallopian tube may continue to be very great.

8. In young girls suffering from dysmenorrhea the history should be followed very carefully, in order to determine the presence of a previous attack of appendicitis.

9. The fact that many of these cases are mistaken for salpingitis accounts for the theory that appendicitis is more common in men than in women.

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